AMENDMENT TO THE CLAIMS

1. (currently amended) A communications network for a metropolitan area comprising:

a plurality of access multiplexers, each access multiplexer operable to provide multiplexing of data packets from a plurality of end-users onto a sparse dense wavelength division multiplexed (S-DWDM) wavelength; the S-DWDM wavelength having an optical precision capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex (DWDM) wavelength plan used in a core network;

a photonic switch, coupled to the access multiplexers via fiber optic cable for carrying a plurality of S-DWDM wavelengths, being all-optical and operable to switch the plurality of S-DWDM wavelengths into a DWDM signal for transmission; and

a core node being part of the core network, coupled to the photonic switch via a fiber optic cable for carrying the DWDM signal, and operable to route the data packets within the communications network or out to a long haul network.

2. (previously presented) The network as claimed in claim 1 wherein the photonic switch includes a multi-wavelength source for generating DWDM quality wavelengths for supplying the access multiplexers with unmodulated wavelengths upon which to multiplex data packets.

3. (previously presented) The network as claimed in claim 1 wherein the core node includes a photonic switch and a packet switch.

4. (previously presented) The network as claimed in claim 3 wherein the photonic switch includes a multi-wavelength source for generating DWDM quality wavelengths for supplying the packet switch with unmodulated wavelengths

upon which to multiplex data packets.

5. (original) The network of claim 1 wherein the data packets are Ethernet packets.

6. (original) The network of claim 5 wherein a portion of the data packets are transmitted from a particular end-user to a particular access multiplexer over a local loop, connecting the particular end-user to the particular access multiplexer, using a digital subscriber line DSL protocol.

7. (original) The network of claim 6 wherein the DSL protocol is a very-high-data-rate VDSL protocol.

8. (original) The network of claim 1 wherein the photonic switches are capable of switching at the wavelength, group of wavelength, and fiber level.

9. (original) The network of claim 1 wherein the core node is capable of switching at the wavelength, group of wavelength, and fiber level.

10. (original) The network of claim 9 wherein the core node is capable of switching data packets based on a service to which the data packet pertains.

11. (original) The network of claim 10 further comprising a plurality of photonic switches, each of the photonic switches connected to at least one other photonic switch and the core node.

12. (original) The network of claim 11 further comprising a plurality of core nodes, each of core nodes connected to at least one other core node.

13. (previously presented) The network as claimed in claim 1 wherein the core node includes a wavelength converter for converting one wavelength to another wavelength to provide an end-to-end photonic connection across the network.

14. (previously presented) The network as claimed in claim 13 wherein the wavelength converter includes opto-electronic devices.

15. (previously presented) The network as claimed in claim 14 wherein the wavelength converter includes photonic devices.

16. (currently amended) A method of operating a metropolitan photonic network comprising the steps of:

providing to an access multiplexer a dense wavelength division multiplex (DWDM) quality unmodulated wavelength from a source remote therefrom;

modulating the wavelength with packet data at the access multiplexer;

multiplexing the wavelength together with other modulated wavelengths to form a sparse dense wavelength division multiplexed (S-DWDM) signal, the S-DWDM signal having an optical precision capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex (DWDM) wavelength plan used in a core network;

transporting the S-DWDM signal to a metro photonic switch, the netro photonic switch being all-optical;

demultiplexing the S-DWDM signal to a plurality of wavelengths;

switching each of the plurality of wavelengths on a per wavelength basis;

multiplexing different switched wavelengths to form a DWDM signal; and

launching the DWDM signal toward a core node in the core network.

17. (previously presented) The method as claimed in claim 16 wherein the step of providing to an access multiplexer a DWDM quality unmodulated wavelength

includes generating a plurality of DWDM quality wavelengths adjacent to a metro photonic switch and coupling one of the plurality of wavelengths to a fiber from the metro photonic switch to the access multiplexer.

18. (previously presented) The method as claimed in claim 17 wherein the step of modulating the wavelength with packet data at the access multiplexer includes the step of receiving packet data from the access network and modulating the unmodulated wavelength from the metro photonic switch therewith.

19. (previously presented) The method as claimed in claim 18 wherein the step of multiplexing the wavelength together with other modulated wavelengths to form a sparse dense wavelength division multiplexed (S-DWDM) signal includes the step of selecting wavelengths having a predetermined separation.

20. (previously presented) The method as claimed on claim 19 wherein the DWDM signal includes N wavelengths and the predetermined separation is s, where N>s and N and s are integers.

21. (previously presented) The method as claimed in claim 20 wherein N is 40 and s is 5.

22. (currently amended) A photonic metropolitan network comprising:

means for providing to the access multiplexer a dense wavelength division multiplex (DWDM) quality unmodulated wavelength from a source remote therefrom;

an access multiplexer including means for modulating the wavelength with packet data at the access multiplexer, and means for multiplexing the wavelength together with other modulated wavelengths to form a sparse dense wavelength division multiplexed (S-DWDM) signal, the S-DWDM signal having an optical precision capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex (DWDM) wavelength plan used in a core network;

means for transporting the S-DWDM signal to a metro photonic switch;

wherein the metro photonic switch is all-optical, includes ~~including~~ means for demultiplexing the S-DWDM signal at the metro photonic switch to a plurality of wavelengths; means for switching each of the plurality of wavelengths on a per wavelength basis; means for multiplexing different switched wavelengths to form a DWDM signal; and means for transporting the DWDM signal to a core node in the core network.

23. (currently amended) A communications network for a metropolitan area comprising:

a plurality of access multiplexers, each access multiplexer operable to provide multiplexing of data packets from a plurality of end-users onto a sparse dense wavelength division multiplexed (S-DWDM) wavelength, the S-DWDM wavelength having an optical precision capable of being interleaved into the optical frequency constraints of a first separation being multiple of a second separation in a dense wavelength division multiplex (DWDM) wavelength plan used in a core network;

a photonic switch, coupled to the access multiplexers via fiber optic cable for carrying a plurality of the S-DWDM wavelengths, being all-optical and operable to switch the plurality of S-DWDM wavelengths into a DWDM signal for transmission;

a core node, coupled to the photonic switch via a fiber optic cable for carrying the DWDM signal, and operable to route the data packets within the communications network or out to a long haul network; and

a control plane coupled to the photonic switch and the core node for effecting end-to-end photonic connectivity.

24. (previously presented) The communications network as claimed in claim 23

wherein the core node includes a packet router and a photonic switch coupled together to effect packet level switching for packets originating at the access multiplexers.

25. (previously presented) The communications network as claimed in claim 24 wherein the core node includes a wavelength converter coupled to the photonic switch to effect an all photonic connection through the network.

26. (previously presented) The communications network as claimed in claim 23 wherein the photonic switch includes a first plurality of input ports and a second plurality of output ports, with the first being greater than the second, whereby the photonic switch effects concentration of the S-DWDM wavelengths from the access multiplexers.